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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,055	07/11/2003	Robert J. Weber	502224	4319
23626	7590	09/09/2004	EXAMINER	
LEYDIG VOIT & MAYER, LTD 6815 WEAVER ROAD ROCKFORD, IL 61114-8018			ROJAS, BERNARD	
			ART UNIT	PAPER NUMBER
			2832	

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/618,055	Applicant(s) WEBBER ET AL.	
	Examiner Bernard Rojas	Art Unit 2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings were received on 06/01/04. These drawings are acceptable.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-15, 16-22 and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma [US 6,531,668] in view of Yao [US 5,578,976].

Claim 1, Ma discloses a micro-cantilever device [figure 3A, 3B] with a base section [22], a cantilever section [220] having a length and a tapered width along the

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length; the cantilever section connected to the base section [at 90], the tapered width a function of position along the length.

Ma fails to teach that the cantilever has a minimum width at the base section.

Yao teaches a tapered cantilever that has a minimum width at the base section [figure 1].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the two teachings and taper the cantilever arm of Ma as suggested by Yao in order to reduce the force required to actuate the cantilever by providing a smaller cantilever cross-section adjacent to the base while still maintaining a relatively large contact area.

Claims 2-7 and 25, it would have been obvious to one of ordinary skill in the art at the time the invention was made to custom tailor the taper function in order to adjust the resonant frequency of the beam.

Claim 8, Yao shows a ground plane [16] is below a portion of the cantilever section.

Claim 9, Ma shows the micro-cantilever has a pull-in voltage that is calculated as a function of the dimensions of the cantilever section and material properties of the cantilever section [col. 5 lines 15-21]. Ma teaches that the cantilever geometry will change its resonance frequency by altering the effective spring-constant-to-mass ratio. This will cause the pull-in voltage formula to change depending on the resonant frequency obtained by the new geometry.

Claims 10-16 and 28-29, it would have been obvious to one having ordinary skill in the art at the time the invention was made to calculate the pull-in voltage since it was known in the art that the function controlling the cantilever pull-in voltage depends on the cantilever length, taper and material from which it is constructed [col. 5 lines 15-21]. Ma teaches that the cantilever geometry will change its resonance frequency by altering the effective spring-constant-to-mass ratio. This will cause the pull-in voltage formula to change depending on the resonant frequency obtained by the new geometry.

Claims 17 and 21, Ma discloses the claimed invention with the exception of using windows on the cantilever.

Yao teaches using windows [28] on the cantilever [20] to in order to enhance switch actuation performance by reducing the weight of the cantilever [col. 3 lines 41-49].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide holes on the cantilever of Ma in order to enhance switch actuation performance by reducing the structural mass of cantilever arm and the squeeze film damping effect of air during actuation of switch [Yao, col. 3 lines 41-49].

Claim 18, Yao teaches a micro-cantilever device which has an axis about which the micro-cantilever is symmetric and that at least one open window is located on the axis [figure 1].

Claim 19, Ma teaches a micro-cantilever device [figure 4A-4C] with a base section [90], a cantilever section [420] having a length and a tapered width along the length, the cantilever section connected to the base section, the tapered width a

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function of position along the length and a second base section [90] wherein the cantilever is attached to the second base section.

Claim 20, Yao shows a ground plane [16] is below a portion of the cantilever section.

Claim 22, Yao discloses a strain relief at the base section in the form of a reduced cantilever cross-section [figure 1].

Claim 23, the reduced cantilever cross-section of Yao acts as a lateral stress relief for a cantilever section.

Claim 24, Ma and Yao discloses Mem switches manufactured using well known manufacturing processes. It would have been obvious to one having ordinary skill in the art at the time the invention was made to manufacture the micro-cantilever device using a Multi-user Micro-Electro-Mechanical Systems Process since it was known in the art that it is a standard Mem manufacturing process along with lithography, and chemical vapor deposition.

Claims 26, 27, 30 and 31, It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the pull-in voltage formula of the cantilever depending on its geometry [col. 5 lines 15-21]. Ma teaches that the cantilever geometry will change its resonance frequency by altering the effective spring-constant-to-mass ratio. This will cause the pull-in voltage formula to change depending on the resonant frequency obtained by the new geometry.

Response to Arguments

Applicant's arguments with respect to claims 1-31 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (571) 272-1998. The examiner can normally be reached on M-F 8-4:00), every other Friday off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Br


LINCOLN DONOVAN
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